

TEXT-BOOKS OF CHEMISTRY.

- (1) *Practical Chemistry*. By Dr. James Bruce and Harry Harper. Pp. viii+240. (London: Macmillan and Co., Ltd., 1910.) Price 2s. 6d.
- (2) *Qualitative Analysis. Tables for Use at the Bench*. By E. J. Lewis. (Cambridge: University Press, 1910.) Price 2s. 6d. net.
- (3) *Outlines of Organic Chemistry. A Book Designed especially for the General Student*. By Dr. F. J. Moore. Pp. x+315. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1910.) Price 6s. 6d. net.
- (4) *The Calculations of General Chemistry, with Definitions, Explanations, and Problems*. Second edition. By Prof. William J. Hale. Pp. xii+175. (London: George Bell and Sons, 1910.) Price 4s. 6d.
- (5) *A.B.C. Five Figure Logarithms and Tables for Chemists, including Electrochemical Equivalents, Analytical Factors, Gas Reduction Tables, and other Tables useful in Chemical Laboratories*. By C. J. Woodward. Pp. iv+70. (London: E. and F. N. Spon, Ltd.; Simpkin, Marshall and Co., Ltd.; New York: Spon and Chamberlain; Birmingham: Cornish Bros., 1910.) Price 2s. 6d. net.

THE first of these books contains in the space of 240 pages an account of the manipulative methods of chemical experiment, a selection of inorganic and organic preparations, instructions for physical measurements, such as the densities of liquids and vapour densities, qualitative analysis of simple salts, and a selection of volumetric and gravimetric methods. In spite of the large amount of ground which is covered, the work is excellently done, and it is a great advantage to find in a single small volume nearly all that is needed in the way of text-book instruction for the practical work of a course passing well beyond the standard of an intermediate B.Sc. course, and almost up to the standard of the final examination. Such criticisms as may be made refer only to matters of detail, and are not intended to detract from the value of a book which is undoubtedly one of the best that has appeared. It may, however, be noted that the method of making ethylene by means of phosphoric acid, as described by Newth in the *Journal of the Chemical Society*, is much superior to the older method, in which sulphuric acid was used, and should be generally adopted. The gas-regulator shown on p. 5 is less efficient than those in which toluene is used, and the pyknometer (Fig. 42) shown on p. 98 has been improved by the use of two bulbs instead of one, as recently described by Mr. W. R. Bousfield. In the volumetric work it is to be regretted that only one method of preparing a standard solution (normal Na_2CO_3 from NaHCO_3) is given, as the checking of these methods against one another forms an excellent test of the accuracy of the work, and is of far greater value than the estimation of acids and alkalis in variable commercial samples; moreover, the estimation of acids is far more accurate if carried out with the help of a standard acid and intermediate alkali than when a standard alkali is used, as in the former case all the errors which arise

from uncertainty as to "end-point," &c., are eliminated.

Amongst the omitted methods are the preparation of standard caustic soda by weighing out sodium, dissolving in alcohol and diluting, and the preparation of standard acid by measuring the density of sulphuric acid of 80 to 90 per cent. strength, and diluting, as described by Marshall in the *Journal of the Society of Chemical Industry*. In the experience of the present writer these methods, in the hands of students as well as in work of the highest attainable accuracy, lead to exact results more readily than most of those that have been described. In the use of permanganate it is doubtful how far it is safe to rely on the purity of the crystals, and as the solutions are not altogether permanent, it would be well to treat them from the beginning as only approximately correct.

(2) The best guarantee of the quality of the material printed on these cards is the name of the author, whose "Inorganic Chemistry" has almost created a new ideal in elementary text-books. How far the idea of using printed and varnished cards will prove superior to the system of practical text-books is a matter that can only be worked out by actual experience in the laboratory.

(3) In comparison with the majority of text-books of organic chemistry, this volume starts with one great advantage—that the authors have not attempted to make it into a dictionary or table of physical constants. They have, therefore, been enabled to deal in a small volume with an unusually large amount of interesting and "advanced" material, usually reserved for works of a more pretentious character. This is in many respects a distinct advantage. On the other hand, they have omitted almost entirely the details of methods of preparation, and so have conferred on the subject with which they deal a certain impression of unreality, which might easily have been removed. If, however, the student who reads the book is at the same time carrying out a course of organic preparations, the risk that he may come to regard the subject as one of algebra and geometry—only loosely attached to experiment by the necessities of verification—will be removed, and the book may then prove both useful and suggestive.

(4) The use of numerical examples is an excellent way of impressing upon a student the meaning of equivalents, vapour densities, molecular and atomic weights; it is also necessary in order to secure accuracy in the calculation of analytical results, especially if this is to be done correctly under the hurried and somewhat unpractical conditions of a "practical examination." This need the author has attempted with some measure of success to supply. The chief fault of the book arises from the fact that most of his examples appear to have originated in the study instead of in the laboratory. No chemist would be likely to use in actual work the bewildering array of standard solutions referred to in chapter x., 2N, N, N/2, N/4, N/5, N/6, N/8, N/10, N/20, &c.; neither would anyone who had experience of the subject expect to obtain a theoretical yield of nitric oxide from 7N nitric acid and copper. These and other calculations of a similar character suggest that the author

is merely attempting to teach chemical arithmetic with no regard for the opportunities which arise of teaching chemistry at the same time. The figures actually resulting from the best experiments are so readily accessible that a book which fails to make use of them and substitutes obvious fictions is scarcely to be recommended.

(5) This book of tables is well compiled, and should prove useful, but the printing and binding are not as good as might be desired in view of the small size of the book and the price at which it is issued.

MINERAL SPRINGS AND WELLS OF ESSEX.

A History of the Mineral Waters and Medicinal Springs of the County of Essex. By Miller Christy and Miss May Thresh, with a critical note by W. H. Dalton. Essex Field Club Special Memoirs, vol. iv. Pp. vi+73. (Stratford, Essex: Essex Field Club; London: Simpkin, Marshall and Co., Ltd., 1910.) Price 2s. 6d. net.

THIS work forms vol. iv. of the Essex Field Club Special Memoirs, and has been reprinted from the *Essex Naturalist*, with additions. As in most other English counties, there are in Essex a number of springs and wells that have attained notoriety as mineral or medicinal waters, and the authors have done well to prepare a full and precise account of them.

The earliest record is of a spring at Wanstead, which was regarded as a spa in 1619, but has long been lost to sight. Witham, Chigwell Row, and Upminster had mineral waters that were formerly reputed to be of medicinal value. No information is available concerning the particular constituents of the Witham Spa; the water of Chigwell Row was purgative, but of no importance; while that of Upminster contained Epsom salts. Tilbury water, obtained from a well, appears to have been most famous in Essex, but, as the authors remark, the saline ingredients were insufficient to justify its being considered a mineral water. Dr. Richard Russel, however, remarked in 1769 that the water "makes excellent Punch, and is extremely good for Tea." The only genuine mineral waters acknowledged in the present work are those of South Weald, Upminster, and Hockley, which contain as the more prominent ingredient magnesium sulphate. As the authors admit, every so-called mineral spring in Essex, with one exception, is now neglected, and almost forgotten; and as regards the waters in general they consider "that 'faith' was an important, if not the chief, element in the 'cures' they are credited with." Dovercourt Chalybeate Spa, discovered about 1852, is the sole remaining spa, and in a sample of the water sent in 1897 to Dr. J. C. Thresh, he reported that it contained under one grain of iron salts per gallon.

The authors express their indebtedness to Dr. Thresh for assistance in dealing with the Essex waters from a chemical point of view, and to Mr. W. H. Dalton for notes on the strata whence the waters are derived. Reference should have been made to the Bagshot Sands on p. 63, as the waters of Hockley, as well as those of South Weald, are derived from that

formation or the passage-beds above the mass of London Clay. There are no deep-seated mineral waters in Essex, but the subject, as shown by the authors, is one of considerable interest, and by no means devoid of scientific importance.

H. B. W.

OUR BOOK SHELF.

(1) *Edible and Poisonous Fungi.* Board of Agriculture and Fisheries. Pp. 28. With 25 coloured plates. (London: His Majesty's Stationery Office, 1910.) Price 1s.

(2) *Guide to Mr. Worthington Smith's Drawings of Field and Cultivated Mushrooms and Poisonous or Worthless Fungi often Mistaken for Mushrooms, Exhibited in the Department of Botany, British Museum (Natural History).* Pp. 24. (London: Printed by Order of the Trustees of the British Museum, Natural History, 1910.) Price 1s.

(1) THE publication of this pamphlet by the Board of Agriculture and Fisheries is intended doubtless to broaden the "mushroom" diet of country dwellers. Whether this object will be attained depends primarily on the doubtful possibility of creating an interest in a lethargic public, and further, in making quite clear the somewhat abstruse differences between the clean and the unclean. With regard to means of discrimination, reliance is placed on coloured plates and short descriptions, to which are added a few hints on preparation for table. What is distinctly lacking is an attractive general account, with information regarding the kinds exposed for sale in foreign market places, where there is often a considerable variety. The list of edible species does not include either the chantarelle or the truffle, while another notable omission is a warning that individuals vary greatly in their power of digesting fungal ferments.

(2) The pamphlet issuing from the British Museum (Natural History) is valuable both as a scientific exposition by one of our most eminent fungologists and also as an authoritative guide for the use of those interested in mushroom cultivation. The descriptions are semi-popular, and the coloured figures are artistic, accurate and well rendered. The setting of the text, as also the plain directions for detecting the poisonous species, add to the practical utility of the pamphlet, which fulfils one of the chief objects of the Trustees, inasmuch as it provides accurate and useful information for the benefit of the general public.

Fractures and Separated Epiphyses. By A. J. Walton. Pp. vii+288. (London: E. Arnold, 1910.)

IN a short preface the author explains that this book is intended for the use of students and those first commencing hospital appointments, but there is every reason to believe it will prove of great value to practitioners in general. Mr. Walton does not confine himself to advising any one method of treatment, but concisely places before the reader the various treatments advocated, with an open-minded criticism of their several points.

The chapters dealing with the etiology and general methods of treatment are, considering the largeness of the subject, both clearly and shortly dealt with, yet nothing of importance has been omitted. In describing the fractures peculiar to each bone, with their treatment, special attention is given to the dates of union in the various epiphyses, and the injuries which they are liable to sustain. The accompanying illustrations, reproduced from radiographs of fractures seen at the London Hospital, are typical and excellent. The book shows great care in preparation, and can be recommended to all who need a short, practical work on this subject.

FRANK ROMER.